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MONTANA GRIZZLY BEAR MANAGEMENT - AND PUBLIC HARMONY

By

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ABSTRACT:

Since 1967 grizzly bears *(Ursus arctos horribilus)* in Montana have been hunted as trophy animals by residents and non-residents holding specific licenses. Unrestricted license sales to residents dropped by 50 percent when the fee was increased from $1 to $5. Although the license issue varied between years, it did not significantly affect the success ratio of 0.7 to 2.3 grizzly bears for each hundred licenses. In addition to hunting, grizzly mortality occurs annually for other reasons. During 1967-73 the known hunting and non-hunting mortalities ranged from 26 to 48 grizzlies. Hunting accounted for 41 to 69 percent (ave. 53) of the mortality during those 7 years. Female grizzlies comprised 25 to 59 percent (ave. 47) of the annual mortality. Ages of the 1972 grizzly mortalities ranged from cub of the year to 19 years and averaged 8.4 years for males and 9.3 years for females. Complaints requiring Departmental action for marauding and nuisance grizzlies exploded to a major program in 1971 in the vicinity of West Yellowstone with the handling of 23 live grizzlies; 7 were handled in 1972 and 9 in 1973. Grizzlies were translocated to sites suggested by the Forest Service in the Gallatin National Forest. The successful relocation of grizzlies is discussed. Control actions for grizzlies also occurred in 3 to 6 locations in the northern Montana grizzly populations during 1971-73. Data from the 1967-1973 hunting seasons do not indicate that the present regulations, licensing procedures or hunter harvest are jeopardizing the grizzly populations in Montana. Recommendations are presented.

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MONTANA GRIZZLY BEAR MANAGEMENT - AND PUBLIC HARMONY![1]

Kenneth R. Greer[2]

Abstract: Since 1967 grizzly bears *(Ursus arctos horribilus)* in Montana have been hunted as trophy animals by residents and non-residents holding specific licenses. Unrestricted license sales to residents dropped by 50 percent when the fee was increased from $1 to $5. Although the license issue varied between years, it did not significantly affect the success ratio of 0.7 to 2.3 grizzly bears for each hundred licenses. In addition to hunting, grizzly mortality occurs annually for other reasons. During 1967-73 the known hunting and non-hunting mortalities ranged from 26 to 48 grizzlies. Hunting accounted for 41 to 69 percent (ave. 53) of the mortality during those 7 years. Female grizzlies comprised 25 to 59 percent (ave. 47) of the annual mortality. Ages of the 1972 grizzly mortalities ranged from cub of the year to 19 years and averaged 8.4 years for males and 9.3 years for females. Complaints requiring Departmental action for marauding and nuisance grizzlies exploded to a major program in 1971 in the vicinity of West Yellowstone with the handling of 23 live grizzlies; 7 were handled in 1972 and 9 in 1973. Grizzlies were translocated to sites suggested by the Forest Service in the Gallatin National Forest. The successful relocation of grizzlies is discussed. Control actions for grizzlies also occurred in 3 to 6 locations in the northern Montana grizzly populations during 1971-73. Data from the 1967-1973 hunting seasons do not indicate

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[1]Presented at the Third International Conference on Bear Research and Management, May 31-June 1, 1974, Binghamton, New York.

[2]Montana Department of Fish and Game, Bozeman, Montana.

that the present regulations, licensing procedures or hunter harvest are jeopardizing the grizzly populations in Montana. Recommendations are presented.

INTRODUCTION

Grizzlies are of historic importance in Montana; Lewis and Clark noted their broad distribution across the state, and they have played an important role in settlement and land management. Since the late 1800's human settlements and landholdings have increased, and the densities and distribution of grizzlies have decreased. Only a few large primitive and wilderness areas of the mountainous regions continue to support grizzly populations.

An early concern about the grizzly bear was expressed in the 1917-18 Montana Fish and Game Commissioner's Biennial Report. A game management division was established within the Montana Fish and Game Department in 1941 and a survey was conducted during 1941-42 to determine the distribution and densities of grizzlies in the Cabinet and Mission mountains, Bob Marshall Wilderness Area, and the Gallatin National Forest. Not many grizzlies were observed. A concern and responsibility for the grizzly was demonstrated as early as 1942 when the traditional spring season for grizzlies was closed statewide; since 1943 only fall seasons have been in effect. Another survey effort, conducted during 1953-54 to determine grizzly densities by track and sign evidence in the Mission and Swan ranges, was unproductive. From 1947-66 the game department used various sources of information to establish an annual estimate of grizzly mortality.

Since 1967 a more detailed documentation of the distribution and numbers of grizzly mortalities has been available (Greer 1970). These recent studies have provided basic information for management direction and have also indicated voids where information is needed. Studies are currently underway, with plans for certain phases to be expanded; another extended and intensive program will be initiated.

National publicity centered on the grizzlies of Yellowstone National Park since 1968, has resulted in a general doomsday image for the species. The problems within the Yellowstone ecosystem, which includes national forests in Montana, Idaho, and Wyoming, have implicated other grizzly populations. While several issues are involved, the basic one concerns the status of the grizzly bear. Decisions currently pending at the national level could directly affect all grizzlies in the lower 48 states.

METHODS

A mail survey was initiated to obtain data on legal grizzly bear kills and grizzly hunters.

In addition to these hunting data, various agencies and other Fish and Game Department personnel cooperated by reporting and assisting with the recovery of information and specimens on grizzly bear mortalities throughout the year. Cementum rings and other skull features were all used for aging each skull.

Hunters are asked to designate the sex of their grizzly on a trophy form, a Department employee verifies sex by viewing the hide, and the sex is confirmed by known parameters of skull features (Greer 1972).

A special management program was required to live-trap and translocate nuisance grizzly bears from the vicinity of West Yellowstone,

and to evaluate a "bear-proof" fence for the garbage dump. Records were kept on fence damage by bears, modifications in the fence, and overall expectations of the closure. Posts were marked and an assistant made frequent inspections to record damage. The ground vicinity of fences were examined for: grizzly or black bear tracks, droppings, digging, bent fence edge, hairs caught in joints of wire fence and barbed wire; and broken threads covering fence indentations to mark openings and reuse.

The action of trapping in response to complaints of grizzly bears also occurred in other areas of the state. A new activity was initiated this year in the form of trapping, holding, and disposing of orphaned cubs.

The grizzly mortalities occurring in Yellowstone and Glacier National Parks are submitted to the Montana Department's Wildlife Laboratory and processed for biological data. These data are tabulated with information collected from allied populations in Montana.

The age of bears were established by examining cementum annulations (Mundy and Fuller 1964; Craighead et al. 1970), subsequently modified to decalcified methods, and complimented by skull features and suture closure. Tagging records from Yellowstone Park and the Montana Cooperative Wildlife Research Unit indicated some grizzly bears to be of known or assigned age.

When necessary, sex was verified or determined using morphometric data from cleaned skulls (Greer 1972).

FINDINGS

The current studies include data on the management program throughout Montana and on the control program centered in the Yellowstone Park ecosystem.

Licensing. Special grizzly bear licensing procedures were established in 1967. Earlier licensing procedures, seasons, regulations, and tagging requirements were previously reported (Greer 1970, 1971, 1972, 1974). While grizzly hunting license fees ($1.00 resident, $25.00 non-resident) remained unchanged for 4 years (1967-1970), the number of licenses issued increased 73 percent for residents (1,022 to 1,769) and 48 percent (143 to 211) for non-residents (Table 1). A second license (Trophy license) is also required if a bear is killed ($25.00 for residents and non-residents). Residents obtained 21, 9, 30 and 11 trophy licenses during 1967-70; non-residents obtained 3, 3, 3 and 2 for the same period.

In 1971, an increased grizzly bear license fee ($5.00 resident, $35.00 non-resident) resulted in an abrupt decrease of resident license sales to 743; license sales have since continued to decline about 10 percent each year with 586 issued in 1973. The fee increase of ten dollars did not affect the issue of non-resident grizzly bear hunting licenses. In fact, non-resident licenses increased from 211 to 1970 to 261 in 1972 before decreasing 14 percent (to 224) in 1973.

Grizzly bear trophy licenses issued during the 3 years (1971-73) of increased license fees showed that 10 to 15 (mean 12.7) trophy licenses were issued to residents and 2 to 7 (mean 4.3) were issued to non-residents.

While increasing of the resident grizzly bear hunting license fee from 1 to 5 dollars significantly changed the ratio of resident to non-resident licenses from 8.3 to 2.8, the overall hunting success increased only slightly above the 7-year average of 1.5 percent.

Table 1. Grizzly bear hunting licenses issued in Montana.

	Hunting License			Trophy License[5]		
	Resident	Non-Res.	Total	Resident	Non-Res.	Total
1967[1]	1,022	143	1,165	21	3	24
1968[1]	1,149	137	1,286	9	3	12
1969[1]	1,474	164	1,638	30	3	33
1970[2]	1,769	211	1,980	11	2	13
1971[3]	743	222	965	15	7	22
1972[4]	673	261	934	10	4	14
1973[4]	586	224	810	13	2	15

[1]Hunting license (residents $1.00, non-residents $25.00) available before and during seasons.

[2]Hunting license (residents $1.00, non-residents $25.00) available until the opening day of the early general big game season on September 15.

[3]Hunting license fees increased to $5.00 for residents and $35.00 for non-residents and deadline for purchase September 14.

[4]Hunting license fee same as previous year and deadline for purchase June 30.

[5]Trophy license ($25.00 resident and non-resident) required after taking a grizzly.

Areas, Seasons, and Hunting Patterns. Until the several grizzly bear populations and ecosystems in Montana are further defined, they are considered generally in this report as: (1) northern grizzly populations-including the Bob Marshall Wilderness Area, Sun River Game Preserve and areas, Mission Mountains, all drainages of the Flathead River, and the Flathead and Blackfeet Indian Reservations; (2) western populations-the Cabinet Mountains and (3) the southern grizzly population-in areas of Montana nearby and adjacent to Yellowstone National Park (Fig. 1).

Of the 17 hunting districts in which grizzly bears have been harvested by hunters since 1967, 3 districts (140, 150, and 316) have annually provided 50-83 percent (mean 67) of the total (Table 2). In 1972 and 1973, 79 and 73 percent, respectively, of the legal grizzlies were from hunting districts (HD) 140 and 150; however, in the prior 5 years the same districts provided only 42-58 percent of the total.

Types of Hunters. A total of 934 grizzly bear hunting licenses were issued to 72 percent residents and 28 percent non-residents during 1972. Most of the 673 residents resided in western Montana and over 100 communities were represented. The 261 non-residents came from 36 states, the Virgin Islands, and Italy. Replies included 62 percent of the residents and 68 percent of the non-residents, of which 8 and 4 percent, respectively, did not hunt.

Replies indicated that 64 percent of the residents and 54 percent of the non-residents with grizzly bear hunting licenses hunted in northwest Montana while 16 and 25 percent, respectively, hunted in the southwest hunting districts. Hunting district 150 includes the Bob Marshall Wilderness area and was the area selected by 24 percent of the residents

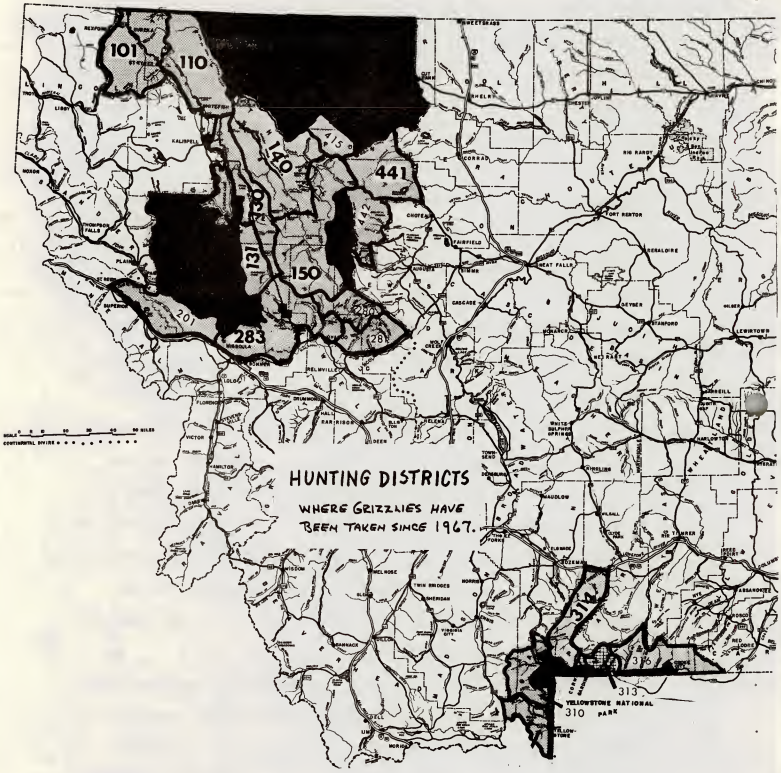

Figure 1. Hunting districts in Montana where grizzlies have been taken in the north and south populations since 1967.

Table 2. Hunter's harvest of grizzly bears in various hunting districts of Montana during 1967-1973.

Hunting District Former	Present	1967	1968	1969	1970	1971	1972	1973
11	110	2	--	1	2	--	1	1
13	130	--	--	--	--	1	--	--
14	140	3	--	5	--	4	5	5
15	150*	7	7	12	5	6	6	6
101	101	1	--	--	--	--	--	--
131	131	2	1	--	--	--	--	--
21	201	--	--	1	--	--	--	--
28	283	1	--	--	--	--	--	--
280	280*	3	--	1	--	2	2	1
281	281	1	--	--	--	--	--	--
310	310	--	--	1	1	1	--	--
313	313	--	--	--	--	1	--	--
314	314	--	--	1	--	--	--	--
316	316*	2	3	2	3	7	--	1
361	361	--	--	1	--	--	--	--
41	441	--	--	1	1	--	--	--
42	442	2	1	7	1	--	--	1
TOTAL		24	12	33	13	22	14	15

*Early hunting season starting Sept. 15 and running concurrently with the regular hunting season of mid-October to late November.

and 46 percent of the non-residents. About 33 and 60 percent, respectively, of residents and non-residents hunted in one of the three early season districts. At least 20 percent of the residents and 12 percent of the non-residents reported seeing one or more grizzlies during their hunt. More than half of the non-residents who observed grizzlies did so in hunting district 150. Of the hunters who did not see a grizzly, about half of them did see bear signs in the form of tracks, droppings, or diggings.

Thirteen replies to the questionnaire provided information on hunting efforts and the bears killed. All but one hunter indicated that they were primarily after elk, but hoped to see a grizzly during their hunt. Only the non-residents were assisted with guides. One resident that killed a grizzly was a guide. Eleven of the hunters did not visit game kill sites for bear activity while two reported that they did. Most (10) of the hunters saw a grizzly before locating an elk; 4 were observed in a meadow, 3 on a trail, 1 after following bear tracks, 1 was feeding on a hunter's elk, and 1 was shot from camp.

Ten of the hunters encountered only one grizzly while three hunters observed two bears at the time of shooting. While 6 hunters were able to move closer to the grizzly before shooting, 7 did not. The estimated distances of shooting were reported as: 4 at 10 to 30 yards, 5 at 50 to 75 yards, and 4 at about 200 yards.

Early Season. About 57 percent (76 of 133) of the grizzlies harvested by hunters during the 7 seasons from 1967-1973 were taken in HD 150, 280, and 316 (Table 3). These districts have an early season preceding the general season for deer, elk, and bear. The early season conventionally

opens on September 15 and ends in late November; the regular big game hunting season opens with variable dates in mid-October (Greer 1974).

Of the 76 grizzlies harvested from the 3 areas, 64 percent were from HD 150, 24 percent from HD 316 and 12 percent from HD 280 (Table 3). About 88 percent of the grizzlies were taken during the early season with most (53%) taken in September. Only 9 were killed during the regular season, including 3 in November. No legal kills were recorded from HD 316 during 7 regular hunting seasons.

In 1972 and 1973, 50 and 47 percent of the statewide grizzly hunting harvests occurred during the "early" hunting seasons of September 15 to October 22 and 21, respectively.

Mortalities. Surveys conducted since 1947 provide records useful for trends of estimated annual grizzly bear mortalities. The estimate has ranged from 10 to 60 (mean 37) grizzlies between 1947-1966 (Greer 1970). The subsequent special grizzly bear license system has provided a more detailed annual record of the known grizzly bear mortalities in Montana. During the period 1967-73, known grizzly mortalities have ranged from 26 to 48, averaging 36. Mortalities are designated as caused by hunting or non-hunting, with several categories in the latter classification.

Hunting Mortality. The total known grizzly bear mortalities have ranged annually from 26 to 48 (mean 36) during 1967-1973. Of these, hunting accounted for an average of 53 percent (range 43-69 percent) (Table 4). Hunters have taken grizzlies in 17 hunting districts since 1967, but in any one year only from 4 to 11 districts have provided grizzlies. The distribution of the known total grizzly bear mortalities during 1973 appear in Figure 2.

Table 3. Hunter harvest of grizzly bears in the three hunting districts having an early hunting season.

Year	State Harvest	Hunting District 150			Hunting District 280			Hunting District 316			Total		
		Early	Regular	Total	Early	Regular	Total	Early	Regular	Total	Early	Regular	Total
1967	24	6	1	7	2	1	3	2	0	2	10	2	12
1968	12	7	0	7	0	0	0	3	0	3	10	0	10
1969	33	11	1	12	1	0	1	2	0	2	14	1	15
1970	13	1	4	5	0	0	0	3	0	3	4	4	8
1971	22	6	0	6	2	0	2	7	0	7	15	0	15
1972	14	6	0	6	1	1	2	0	0	0	7	1	8
1973	15	5	1	6	1	0	1	1	0	1	7	1	8
TOTAL	133	42	7	49	7	2	9	18	0	18	67	9	76

Table 4. Annual known mortality or other loss of grizzly bears from Montana and grizzlies processed for the adjacent national parks.

	1967	1968	1969	1970	1971	1972	1973	7-Year Total	7-Year Avg.
NON-HUNTING									
Illegal	7	4	4	9	6	7	4		
Marauders	4	3	1	4	6	5	2		
Nuisance	0	0	0	1	7	1	1		
U.S. Fish and Wildlife Serv.	2	3	4	2	2	3	0		
Blackfeet Ind. Res.	4	6	3	0	3	1	3		
Flathead Ind. Res.	0	0	3	0	0	0	1		
Live Cubs of the Year	0	0	0	0	0	3	0		
Total Non-Hunting	17	16	15	16	24[b]	20	11	119	17
Total Hunting[a]	24	12	33	13	22	14	15	133	19
Total Mortality	41	28	48	29	46	34	26	252	36
Percent Hunting	59	43	69	45	49	41	58	-	53
Glacier National Park	4	2	3	1	0	0	1		
Yellowstone National Park	6	12	11	16	7	9	0		
Total in Parks[c]	10	14	14	17	7	9	1		

a - All hunting seasons are fall, only.
b - 2 illegal mortalities verified March 1974; changed this total of previously reported 22 to 24.
c - Specimens received at the wildlife lab.

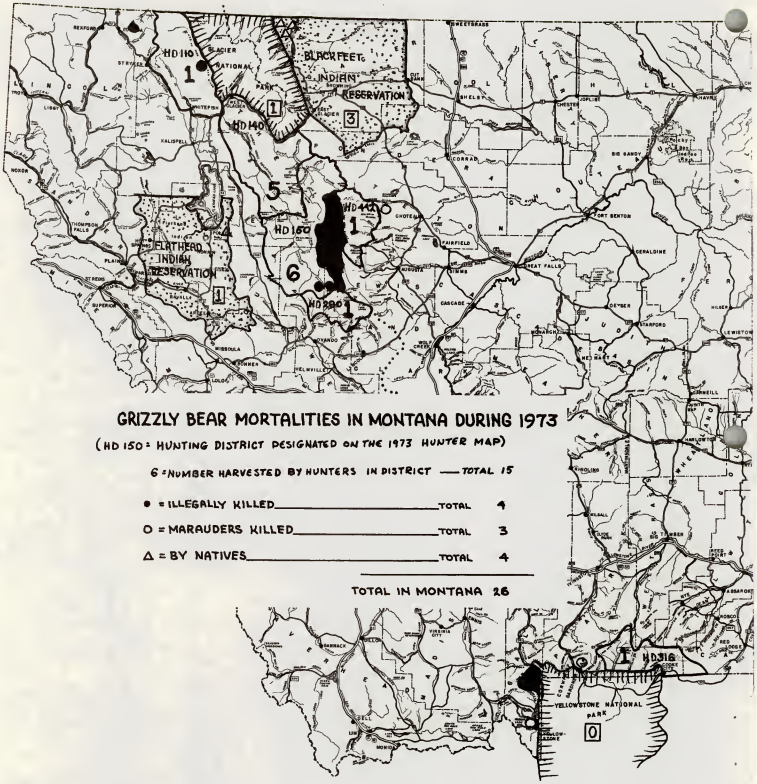

Figure 2. Distribution of known grizzly bear mortalities in Montana during 1973.

From 59 to 100 percent of the annual hunter harvest in 7 years has occurred in the 12 hunting districts comprising the northern grizzly populations (Table 2). The southern grizzly population, including 5 hunting districts in the Gallatin National Forest (Montana's segment of the Yellowstone grizzly ecosystem) provided an average of 18 percent of total hunter annual take during the same period.

Non-hunting Mortality. Other grizzly mortality or loss occurring each year includes: 1) illegal kills (intentional, accidental by misidentification, or violations involving a legal kill); 2) killing of marauders (bears that threaten life or personal property); 3) killing of nuisance bears (repeated visitation to inhabited areas); 4) killing of livestock predators (U. S. Bureau Sport Fisheries and Wildlife Predator Control Agency); 5) killing under treaty rights (Indian Reservations - usually control actions by natives on the Blackfeet and Flathead Indian Reservations); 6) capture of orphaned cubs; 7) transfer to zoos (usually an alternate solution to killing any of 1 to 6). The latter two groups are of live grizzlies removed from Montana populations.

The known non-hunting mortalities ranged from 11 to 24 grizzlies (mean 17) during 1967-73 and comprised a 47 percent mean of the total known annual mortalities. Except for 1971, when a major translocation program of grizzlies was required in the southern populations (Greer 1972), annual non-hunting mortalities in the southern populations were 20 percent or less compared to 80 percent in the northern populations.

Sex and Age of Grizzly Bear Mortalities. Over 95 percent of the grizzlies killed by hunters are taken without any selection for size, sex or age. Because grizzly bears reach a reproductive age slowly, and are irregular

in their first or subsequent pregnancies (Craighead et al. 1969), females may be a critical component in respective populations. Consequently, close surveillance of female mortality is required to determine the productivity and status of the species.

Although differences occurred in the annual hunting and non-hunting mortality of females, the 7-year averages are nearly identical. Combined, they accounted for 46 percent of the total mortality (Table 5). The female mortality by hunting was 25 to 39 percent in 1967-69 and the following 4 years ranged from 54 to 68 percent. During control action programs in Yellowstone National Park, female grizzly losses averaged 45 percent of the total.

Ages were determined for most of the grizzly mortalities. Although samples are rather small for various groupings, some generalities are noted. Age designation by cementum layering only revealed identical numbers of rings in four consecutive root sections from the same row of cheek teeth in 19 percent of 64 grizzlies (unpublished data).

Consolidating all age groups provides some comparisons between groups and locations (Table 6). During 1970-73 the average age from all bears ranged from 6.1 to 9.4 years, but males averaged about 1 year greater in 1970 and 1973, and females averaged about 2 years greater in 1971 and 1972. Most years, samples of 1 to 3 are too limited for comparisons between north and south populations. In a few, the average ages are not strikingly different. The average age of grizzlies from Yellowstone National Park - a non-hunted and stable population - are not very different from the regularly hunted northern populations. If these average ages derived from available samples may be considered as an

Table 5. Total known grizzly losses showing the percentage that were female mortalities. Data are from Montana and adjacent national parks.

	1967		1968		1969		1970		1971		1972		1973		7 Yr. Avg.	
	No.	%F	No.	%F	No.	%F	No.	%F	No.	%F	No.	%F	No.	%F	No.	%F
Hunting	23	35	12	25	33	39	13	54	22	68	14	50	15	60	132	47
Non-hunting	6	17	8	25	8	88	8	63	17	47	16	38	10	30	73	44
TOTAL	29	31	20	25	41	49	21	57	39	59	30	43	25	48	205	46
Glacier National Park	4	100	1	0	3	33	1	100	0	0	0	0	1	100	10	70
Yellowstone National Park	6	50	11	27	11	36	16	69	7	43	9	44	0	0	60	45

Table 6. Average age of grizzly bear mortalities (by sex and age) in North, South, and Yellowstone Park populations.

	1967		1968		1969		1970		1971		1972		1973	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Hunting	--	--	4.8(5)	7.0(2)	8.1(16)	5.0(11)	7.3(6)	7.0(6)	5.7(7)	8.5(14)	5.3(7)	9.4(7)	7.8(6)	6.6(9)
Non-Hunting	10.0(5)[a]	16.0(1)	11.1(6)	6.0(2)	1.8(2)	6.4(8)	9.3(3)	7.0(5)	7.8(8)	8.5(6)	8.4(7)	9.3(4)	6.5(6)	4.7(3)
TOTAL	10.0(5)	16.0(1)	8.3(11)	6.5(4)	7.4(18)	5.6(19)	8.0(9)	7.0(11)	6.8(15)	8.5(20)	6.9(14)	9.4(11)	7.2(12)	6.1(12)
North	--	--	--	--	8.5(15)	5.1(8)	7.0(6)	6.9(8)	3.8(4)	8.0(12)	5.9(12)	9.4(11)	7.1(10)	6.1(11)
South	--	--	--	--	2.0(1)	4.7(3)	10.0(3)	7.3(3)	7.9(11)	9.3(8)	12.5(2)	-(0)	7.5(2)	6.0(1)
TOTAL	--	--	--	--	8.1(16)	5.0(11)	8.0(9)	7.0(11)	6.8(15)	8.5(20)	6.9(14)	9.4(11)	7.2(12)	6.1(12)
Yellowstone National Park	3.5(4)	9.5(2)	8.4(8)	5.8(4)	8.4(7)	12.0(4)	7.1(5)	5.8(11)	18.0(3)	13.3(3)	6.9(5)	11.4(4)	-(0)	-(0)

[a]Age (sample size)

approximate representation of the populations, then it appears that age classes are uniform in the sub-adult, young adult, prime adult, and old adult groups for each of the sexes.

Each year during 1970-73 grizzly mortalities in Montana were about equally represented in each sex for young, prime, and old groups (Table 7). Except for 1971, which included several translocated grizzlies (Greer 1972), the age structure of all bears lost in each of 3 years, with samples of 20 to 30, was 45-50 percent sub-adults (4 years or less) and 50-55 percent adults (5 years or more). In the combined three years, with the exclusion of 1971, the age of 75 Montana grizzly mortalities were 48 percent sub-adult and 52 percent adults. Including 1971, the sample of 113 grizzlies were classified as 44 percent sub-adults and 56 percent adults. Mortality for female grizzlies during 1972 and 1973 was 43 and 48 percent of the kill respectively. The average age of 11 and 12 females killed in 1972 was 9.4 and 6.1 years, respectively.

The age of grizzlies from Yellowstone National Park that were processed at the wildlife lab are presented in Table 8, but they are an incomplete sample.

Hunting Districts Adjacent to Yellowstone National Park. A total of five administrative hunting districts in Montana are adjacent to the northwest and north boundary of Yellowstone National Park (Figure 3). One of the five districts, HD 316, is high in elevation and has an early opening season because it is subject to early snows which precludes access during the general October-November season. This area has traditionally been opened to hunting on September 15.

During 1967-1970, hunters harvested 2 or 3 grizzlies each year from HD 316. Eighty percent of the grizzlies were taken in September

Table 7. Age groups of grizzly bears lost (by sex and age) from Montana during 1967-1973.

AGE GROUPS	1967		1968		1969		1970		1971			1972			1973		
	M	F	M	F	M	F	M	F	M	F	U	M	F	U	M	F	U
Sub-Adults																	
Cub of year	1	-	-	-	1	2	-	-	-	1	2	3	-	2	-	-	-
Yearling	-	-	1	-	-	-	1	1	-	-	-	-	1	-	-	-	-
2-Year	-	-	1	2	3	1	1	1	1	-	-	2	-	1	-	-	-
Pre-Adults	2	-	4	-	3	5	2	3	3	7	-	4	2	-	4	7	1
Adults																	
Young-Adult (5-9 yr)	-	-	1	-	4	9	2	2	9	7	-	6	3	-	6	1	-
Mature-Adult (10-14 yr)	-	-	1	2	6	2	1	3	1	1	-	-	2	-	1	3	-
Prime-Adult (15-19 yr)	1	1	2	-	-	-	2	1	1	3	-	2	3	-	-	-	-
Old Adult (20-24 yr)	1	-	1	-	1	-	-	-	-	2	-	-	-	-	-	-	-
Very-Old (25 and + yr)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
TOTAL	5	1	11	4	18	19	9	11	15	21	2	17	11	3	12	11	1

Table 8. Age groups of grizzly bear losses from Yellowstone National Park (processed at the wildlife lab during 1967-1973).

AGE GROUPS	1967 M	1967 F	1968 M	1968 F	1969 M	1969 F	1970 M	1970 F	1971 M	1971 F	1972 M	1972 F	1973 M	1973 F
Sub-Adults														
Cubs of year	-	-	2	-	-	-	1	2	1	-	1	1	-	-
Yearling	-	-	1	1	1	-	2	-	-	-	-	-	-	-
2-Year	1	-	-	1	-	-	-	2	-	-	-	-	-	-
Pre-Adult (3-4 yr)	2	-	-	1	-	-	-	2	-	-	-	-	-	-
Adults														
Young-Adult (5-9 yr)	1	1	-	-	4	1	-	3	-	1	3	-	-	-
Mature-Adult (10-14 yr)	-	1	3	-	1	2	1	1	1	1	1	2	-	-
Prime-Adult (15-19 yr)	-	-	2	1	1	1	1	1	1	-	-	1	-	-
Old-Adult (20-24 yr)	-	-	-	-	-	-	-	-	1	1	-	-	-	-
Very-Old (25 and + yr)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	4	2	8	4	7	4	5	11	4	3	5	4	0	0

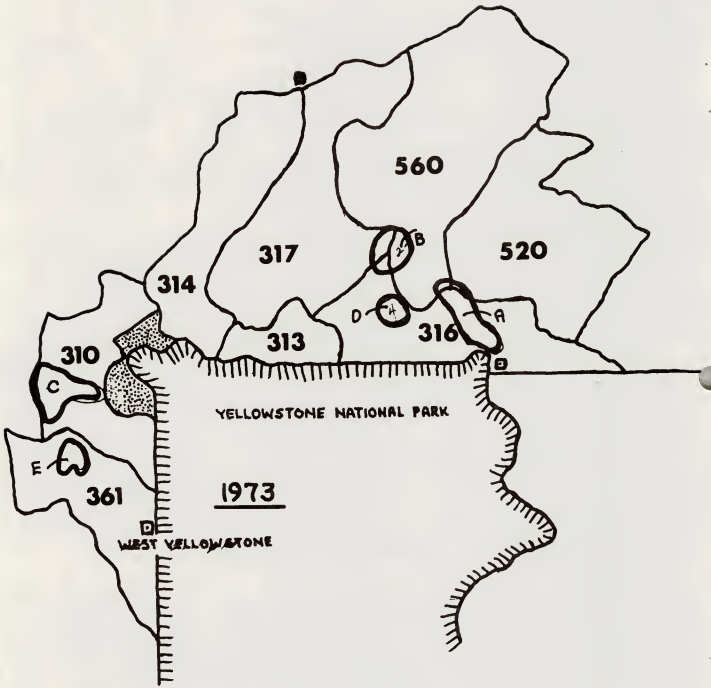

Figure 3. Hunting districts and grizzly bear translocation sites A-E in Montana during 1973.

and 20 percent in early October, all prior to the opening of the general big game season (Table 3). The remaining four hunting districts (310, 313, 314, 361) produced four grizzlies (Table 2).

Although seven years of data are available for hunting districts adjacent to Yellowstone National Park, only the initial four-year period of 1967-1970 may be considered to involve undisturbed grizzlies (Table 9). During 1971, 1972, and 1973, 17, 4, and 3 grizzlies, respectively, were translocated into the hunting districts north of Yellowstone National Park before the hunting seasons (Greer 1972, 1974). They were moved a distance of 50-60 miles, probably into or near areas with which they were familiar. Some of the relocations were of short duration, as four bears were retrapped at the original captive site within 19 to 48 days. Three moved bears were retrapped in the vicinity of West Yellowstone in the succeeding years, and some were never reobserved.

In 1971, a total of 9 grizzlies were taken in 3 of the 5 Montana hunting districts adjacent to Yellowstone National Park. This kill followed the relocation of 17 West Yellowstone grizzlies July 2 - August 17. A marked 5-year-old male killed on November 28 at the head of Sage Creek (HD 310) was a bear moved 50 airline miles on July 23 from West Yellowstone to nearby at site C (Fig. 4). Seven grizzlies were taken by hunters from HD 316 between September 16 and October 4. However, only two of the 7 were translocated from West Yellowstone, two were unmarked and three held Park tags. In 1972, hunters did not kill any grizzlies in the five hunting districts, and during 1973 only one bear, a male, was killed. This kill was in HD 316, and the bear carried a Park tag.

Table 9. Hunting (H) and Non-Hunting (O) Grizzly Mortalities During 1967-1973 in the Five Hunting Districts of Gallatin National Forest Adjacent to Yellowstone National Park.

	Prior to Translocations[1]										After Translocations							
	1967		1968		1969		1970		1971		1972		1973	
District	H	O	H	O	H	O	H	O	H	O	H	O	H	O
310	-	-	-	-	1	-	1	-	1	-	-	-	-	-
313	-	2	-	-	-	-	-	-	1	1	-	-	-	1
314	-	-	-	-	1	-	-	-	-	-	-	-	-	-
316	2	-	3	-	2	1	3	1	7	2	-	1	1	-
361	-	1	-	1	1	-	-	2	-	9	-	2	-	1
Total Hunting	2		3		5		4		9		0		1	
Total Non-Hunting		3		1		1		3		12		4		2

[1]See Text.

Figure 4. Grizzly bear translocations and designated areas in Gallatin National Forest during 1973.

Bear Control

Conflicts with grizzly bears occurred in at least 4 and as many as 7 areas of the state during the past 3 years. Some encounters were acted upon immediately when the landowners shot the grizzlies. Other complaints were reported to Department personnel for live trapping and removal. Grizzly control actions have been required since 1967 on the Blackfeet Indian Reservation and since 1971 in the West Yellowstone area.

Northern Areas. Complaints on the Reservation are acted upon by natives or the U.S.B.S.F.W. predator section. Grizzlies taken by government trappers are forwarded to the Montana Department's lab, but none of the grizzly heads were available from the bears taken by natives until this year. With the exception of 1970, from 1 to 6 grizzlies were killed on the Reservation in each year from 1967-73.

Encounters, complaints and control efforts have been carried out by citizens and Department personnel near Eureka, Polebridge, Big Fork, Flathead Indian Reservation, Spotted Bear, Choteau, Augusta, Alice Creek, and others.

West Yellowstone Area. Grizzly and black bears *(Ursus americanus)* have co-inhabited the vicinity of West Yellowstone during the spring, summer, and fall seasons for many decades. As man's interest and properties increased, so have the complaints about nuisance bears. Community and independent garbage dumps were traditional foraging sites for several generations of bears in this area.

In most years, the occasional grizzly may appear in the area by late April, but they do not normally conflict with man. As bear numbers and activities increase during May, June, and July, a few become

nuisances, a public complaint frequently follows, and control action is required.

1971 Season: The last open garbage dump at Trout Creek in Yellowstone National Park, and the open dump near West Yellowstone, were both eliminated before the 1971 summer season. The West Yellowstone dump was relocated on level ground and constructed as a bear-proof exclosure that included a chain link fence inside an electrified three wire stock fence. Details of construction were reported by Greer (1972).

The abrupt relocation of the West Yellowstone community dumping area for the 1971 season resulted in an expected increase of grizzly bear complaints. In 1971 a control program was required and live-trapping involved 230 culvert trap sets and 25 snare sets from June 23 to Sept. 22, resulting in 23 captures of 19 grizzlies (11 males and 8 females) (Greer 1972). A few grizzlies visited this dump in October and November and one was in the town of West Yellowstone during the first week of November. It was anticipated that for two or three years following closure of the dump, control effort will be required, and thereafter only a few animals are expected each year.

Transplant sites suggested by the Forest Service were available in the Gallatin National Forest (Fig. 4) and, of the 17 grizzlies relocated in the areas all but three (18%) are not known to have been killed, observed in translocation areas, or seen in other locations during the same year (Greer 1972).

1972 Season: During the winter of 1971-72, snow caused damage to the bear fence around the West Yellowstone dump. Improper construction appeared to be the likely cause.

During the dump's second season of operation (1972) it was found that the facility was not bear-proof as expected. While the damaged fence was rewired where needed, the top edge was not completely reinforced. Bears visited the area throughout the summer and on several occasions it was known that some entered over the fence, foraged in the dump, and exited over the fence in the same or different locations. Intermittent observations and investigations by a local observer indicated that from 4 to 8 grizzlies had entered the dump during the summer of 1972. While only 3 grizzlies were captured from this area it is considered that 15 to 25 individual grizzly bears had visited the area one or more times during the period, resulting in more than 50 grizzly visits.

The death of certain translocated grizzlies during the required management program of 1971 led us to anticipate fewer troublesome grizzlies around West Yellowstone in 1972. Grizzlies were present during 1972 in the same periods and in the same areas as 1971. Live trapping began on June 23, precisely the same date as the previous year. About 125 culvert trap sets were required through September 15, resulting in the capture of 7 grizzlies. Excluding the dump area, from 5 to 10 grizzlies were also known to be in the vicinity of West Yellowstone for a few to several days during 1972, but without formal complaints, trapping attempts were not required. Snare sets were not necessary as in the previous year. The required trapping effort during 1972 was about 50 percent less than in 1971, and the number of individual grizzlies captured in 1972 was about 70 percent less than in 1971.

1973 Season: Intermittent minor repairs to the fences enclosing the West Yellowstone dump were insufficient for excluding bears. This situation continued into 1973. The 10 foot chain-link fence (with 3 feet buried) was wired in only 3 places to an iron cross bar between uprights. Three strands of barbed wire topped the fence, and 3 strands of charged barbed wire were attached to iron posts placed one foot outside the main fence. This design did not prevent bears from reaching the disposal pit. Bears contacted the 3 stranded electric fence, while climbing outside of the main fence. Upon reaching the fence top their weight stretched and broke the wire tie downs. They then squeezed between the fence edge and horizontal pipe support to get down the other side. At each location, the wire fence was depressed out of shape by the weight of the individuals. Bears exited in the same or different locations, as none were ever discovered inside the enclosure. Bent fence sections were frequently used by bears as evidenced by hairs and by broken thread links strung across the opening. Most tracks around the dump were of adult grizzly size and cubs of the year were noted with a larger track, presumably a female, on two different occasions. During the season 11 digging attempts were made by grizzlies to get under the fence.

In at least 28 instances grizzlies entered and left the enclosed dump. As evidenced by broken cross threads, some bears used an existing fence opening to enter and leave the dump, although some of the bears could have exited through a second opening. All fence breaks were bent inward.

By track size, it was considered that a minimum of 13 and possibly as many as 24 grizzlies visited inside the dump. Others may have visited the dump but not gained entry. With this many individual bears visiting the area one or several times from May to November, we can assume the total at perhaps 100 visits. Only when grizzlies repeatedly entered or damaged the fence were traps used to attempt capture of the offenders. On 7 occasions one or more traps were used for a total of 11 trap sets to capture 3 adult males and 1 adult female. One of the males had been trapped and translocated 45 air miles in the previous year.

The estimates of grizzly visits are probably conservative considering the number of previous observations in the area (Greer 1972). A month after the former West Yellowstone dump was discontinued, leveled and covered, 5 and 9 individual grizzlies were censused during a few hours (June 23 and 29, 1971, respectively).

Trapping effort required at the dump and in the West Yellowstone vicinity during 1973 was about 40 percent less than in 1972. The capture of 7 individuals was the same (Table 10).

Marked bears: Various grizzly bear studies conducted in Yellowstone National Park during the past several years have included the marking of individuals by ear tagging. Tagged grizzlies have been observed for many years in the dump, campground, town, and resort areas of West Yellowstone. Since 1971 the management program has involved the trapping of 31 individual grizzlies (excluding 2 cubs of the year) with 58 percent holding ear tags at the time of capture. At least one additional grizzly not holding an ear tag did have a slit ear which may have been the result of a lost tag. In 1971, 11 of 19 grizzlies captured

Table 10. Control actions and capture of grizzlies in the vicinity of West Yellowstone during 1971-73.

	1971	1972	1973
Culvert trap sets	230	125	50
Snare trap sets	25	0	0
Grizzlies trapped	23	7	7
Grizzlies trapped at dump	0	3	4
Grizzlies translocated	19	5	6
Recapture[1]	4	2[3]	1[3]
Unobserved[2]	3	5	2

[1]Recapture of grizzly from the same site in the same year after translocation.
[2]Translocated grizzly not subsequently reported during the same year of handling.
[3]Recapture of grizzly that was captured at West Yellowstone and translocated the preceding year.

already had ear tags; in 1972, 4 of 7 were tagged; and in 1973, 3 of 5 (2 cubs of year excluded) held tags.

The Yellowstone Grizzly Bear Ecosystem. Until the boundaries of an ecosystem unique to Yellowstone grizzlies are established by the three adjacent States, this ecosystem can be considered to be comprised of the Park and the five national forests surrounding the Park (Fig. 5).

In the past few years conflicts and confusion have existed about the annual grizzly mortalities in the Yellowstone ecosystem. Annual mortality includes hunting, non-hunting and removal of live grizzlies from the population in an area. Knowledge or rumors of grizzly mortalities that are reported, investigated and verified by respective organizations are included in the *"official"* report by the designated representative in Montana, Wyoming, Idaho and Yellowstone National Park. These representatives are indicated in Table 11.

Hunting accounted for only 28 percent of the known man-caused grizzly bear mortalities in the Yellowstone ecosystem during the past 4 years. Records for 1967-70 show that 2 of 5, 3 of 4, 5 of 6, and 4 of 7 grizzly deaths in the Montana portion of the Yellowstone ecosystem resulted from hunting (total-14), whereas non-hunting deaths (8) accounted for the rest. In the subsequent years of 1971-1973, hunting accounted for 36 percent (a total of 10) of the 28 known mortalities in the five hunting regions of the Gallatin National Forest (Tables 10 and 11).

The grizzly bear translocation program, required in the Gallatin National Forest since 1971, contributed indirectly to several non-hunting mortalities in that year because of conflicting interests with livestock grazing allotments in and nearby the transplant sites.

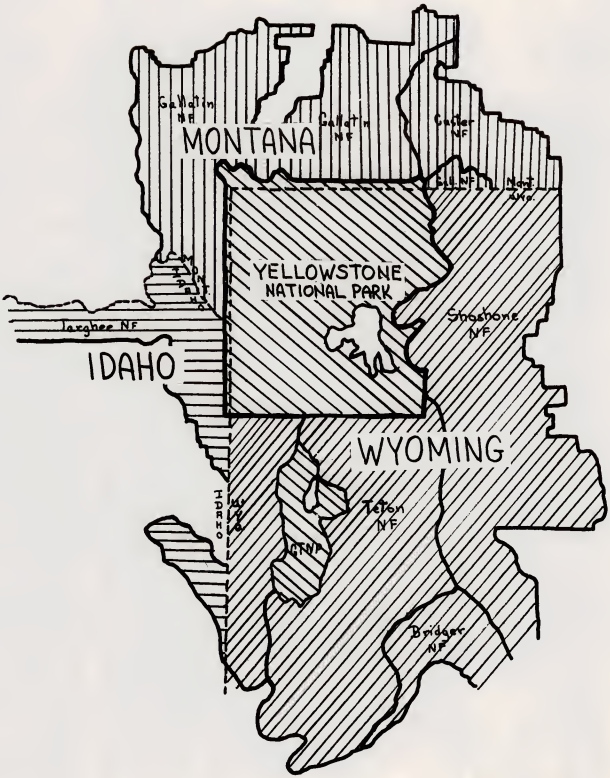

Figure 5. The five National forests adjacent to Yellowstone National Park that are partially included in the Yellowstone Ecosystem.

Table 11. Annual grizzly mortalities[1] in the Yellowstone ecosystem (Yellowstone National Park; Gallatin, Custer, Targhee, Shoshone, and Teton National Forests) during 1970-1973.

	National Forests								
Year	Gallatin[2] and Custer (Mont.)	Targhee[3] (Idaho)	Targhee (Wyo.)	Shoshone (Wyo.)	Teton (Wyo.)	Total[4] (Wyo.)	Total Forests	YNP[5]	Total Ecosystem
1970	7	7	0	8	4	12	26	20	46
1971	21	5	2	8	2	12	38	7	45
1972	4	5	1	3	3	7	16	9	25
1973	3	4	0	5	2	7	14	1*	15
TOTAL	35	21	3	24	11	38	94	37	131
4-Yr. Avg.	8.8	5.3	0.8	6.0	2.8	9.5	23.5	9.3	32.8
Number and (Percent) Mortality by:									
Hunting	14 (40)	0 (0)	0 (0)	17 (71)	5 (45)	22 (58)	36 (38)	0 (0)	36 (27)
Non-Hunting	21 (60)	21 (100)	3 (100)	7 (29)	6 (55)	16 (42)	58 (62)	37 (100)	95 (73)
Total	35	21	3	24	11	38	94	37	131

[1]Includes all grizzlies removed from various populations (to zoos, road kills, known natural mortalities, illegals, marauders, nuisance, Indian reservations, and hunting).
[2]Source by Kenneth R. Greer, from Montana Department of Fish and Game records.
[3]Source by Frank DeShon, from Idaho Fish and Game Department records.
[4]Source by Larry J. Roop, from Wyoming Game and Fish Department records.
[5]Sourcy by Glen F. Cole (1974) from Yellowstone National Park records.

*Received August 1974 - A weathered carcass that was a probable road casualty during 1973.

The Idaho Fish and Game Department has not authorized a grizzly bear hunting season since 1946 and is therefore officially "protecting" the grizzly. Some grizzlies are killed in Idaho, however, and there are both surmised and authentic estimates of this kill. *"Official"* Idaho Fish and Game Department records recently reported that grizzly mortalities do occur. In the northern portion of the Targhee National Forest bordering Yellowstone National Park and the southern boundary of the Gallatin National Forest, mortalities of grizzlies have been, and are, occurring with a high degree of regularity and persistence. A minimum of 7, 5, 5 and 4 grizzly mortalities have been verified during 1970-1973, respectively. Continued diligent investigations with full cooperation of the persons questioned would possibly reveal the numbers of grizzly mortalities to be even greater. Most, if not all, of these grizzly mortalities are the result of conflicts between bears and sheep ranchers.

The Wyoming Game and Fish Department has held regular grizzly bear hunting seasons in the spring and fall of 1970-1973. Like Montana, Wyoming also has a significant number of non-hunting grizzly mortalities. An *"official"* report by the game department indicated that in the three forests (Targhee, Teton, and Shoshone) adjacent to Yellowstone National Park, only 58 percent of the 38 known grizzly mortalities during 1970-1973, inclusive, have been due to hunting (Roop, personal comm.).

During the same period of 1970-1973, Yellowstone National Park *"officially"* reported that 20, 7, 9 and 0 grizzlies were removed from Wyoming populations inside the Park (Cole 1974).

DISCUSSION AND CONCLUSION

Aspects of the Problem

The grizzly bear has various meanings to different people and several views, values, and standards may be individually or collectively attached to this species: a heritage of adventure and intrigue; a species to be maintained at maximum densities compatible with good forestry practices and recreation, but with optimal annual harvests; part of the western mountain wilderness concept; a coveted big game trophy; a species that cannot be maintaned at former densities; a potential threat to life; and many other personal images.

In the past five years, local and national publicity has magnified the controversy about management of the Yellowstone Park grizzly population. Some of this controversy, scientific fact, and misinformation have been extended to other grizzly populations in Montana, Wyoming, and Idaho. Within the past year several conservation groups have exerted "pressures" on federal agencies, state departments, other organizations, and individuals to force the reclassification of grizzlies as an endangered species. Such classification would lead quickly to a ban on hunting.

Available Information

Since 1967, regulated hunting and other known man-caused mortality of grizzlies have been annually documented in Montana. These data have been the basis for recommendations to refine and direct the management program over the past seven years. Studies reveal: 1) that

26 to 48 grizzlies were killed each year; 2) that 53 percent were taken by hunters and 47 percent for other reasons; 3) that 47 percent of the annual mortality are males; 4) that the average age of mortalities in hunted populations of Montana and non-hunted populations in Yellowstone National Park for 7 years were respectively, 7.8 and 7.5 years for males and 8.4 and 8.3 years for females; 5) that about 45 percent of the annual mortalities are sub-adults of four years or younger and 55 percent are adults five years or older; 6) that the age of bear mortalities are similar to age structures in census reports of grizzlies in Yellowstone and Glacier National Parks; 7) that some hunting districts should be closed to hunting grizzlies; 8) that increased license fees voluntarily decreased resident licenses by 50 percent; 9) that hunting season adjustments can curtail the hunter's harvest; and 10) that some grizzlies are expanding their present range.

Mortality data may be compared with a three year field census in Yellowstone National Park during 1968-1970 and a mean classification of 49 percent sub-adults (3 to 4 years and less) to 51 percent adults (5 years or more) (Craighead, per. comm.). Hornocker (1962) censused grizzly in Yellowstone National Park during 1960 and 1961 and reported respective population classification of 33 and 38 percent young (cub, yearling and 2 year), 7 and 14 percent young adult and 60 and 48 percent adults. Martinka (1974) classified grizzly in Glacier National Park during 1967-1971 and reported a mean of 32 percent young (cub and yearling only) and 68 percent adults.

Although the mortality sample is rather small (20-30) for individual years, there is an impression that it may be more than just

coincidental that the annual or combined mortality resembles the classification in living populations.

Complaints about grizzly bears around man's dwellings and properties have gradually increased in several locations during the past few years. Some control actions were initiated by the public, resulting in immediate death of the grizzly; some departmental control actions were unsuccessful; and some captures and translocations were successful. During 1972, control actions of grizzlies were required in the vicinity of Polebridge, Big Fork, Lincoln, Silver Gate, the Blackfeet Indian Reservation, and West Yellowstone. Only 1 or 2 grizzlies were involved in 10 of the areas requiring control action, but a continuous program was necessary throughout the summers of 1972 and 1973 at West Yellowstone.

The community dump at West Yellowstone (Greer 1972) increased as an attraction for grizzly bears. During 1973, from 20-30 grizzlies intermittently visited the dump, double the visits during 1972. In mid-summer, the 3 strand electric fence was relocated and an additional hot, smooth wire (and later a hot strand of barb wire) were each suspended 18 inches out and five feet above the ground. Grizzlies still visited and entered the dump after these modifications, with more fence damage and bear entries than in 1972.

Live trapping of grizzly bears as a control technique requires considerable time and effort. During the extensive grizzly bear studies in Yellowstone National Park, at least 775 captures (Craighead and Craighead 1971, Cole 1971), resulted in trap avoidance by some bears. Trapping as a control effort at West Yellowstone since 1971 involved 31 grizzlies and included 58 percent already with ear tags.

The live capture of grizzly bears in response to nuisance complaints introduces the added problem of disposal. Many suggestions for disposal were pursued, but with negative results. Relocation within the national forest near to the captive site has provided a favorable, though temporary, solution. Some injured, incorrigible, or very old individuals are considered poor risks for translocation and perhaps should be dispatched.

Repeated relocations of grizzlies of various sex and age may or may not have a corresponding disturbing effect on each other or on resident grizzlies. Grizzlies taken by hunters reveal that untagged and Park tagged individuals are present in the general habitats of translocated grizzlies from West Yellowstone.

Apparently, several grizzly bear populations occur in Montana, providing an annual hunting harvest if kept at acceptable levels. Other forms of annual mortality which occur are more difficult to manage. The major grizzly habitat and populations occur in and adjacent to the Bob Marshall Wilderness area (HD 15), the location of hunter killed grizzlies has been well distributed within this 1 million acre area. The sex and age of bears taken in this area also came within the limits of management estimates. It would appear that this area, in providing about 7 grizzlies a year (range 5 to 12), has not experienced a deleterious reduction in resident population numbers or distribution. Adjacent areas to the north and south, including the South Fork of the Flathead River and the Lincoln-Scapegoat Wilderness Area, likewise show no evidence of over harvest. In fact, reproductive and density data are

generally at favorable levels and actually increasing in a few areas. A further increase in bear numbers could result in an increase of nuisance animals, and increased control actions could be required.

Hunting vs. Non-Hunting

Certain individuals, groups and organizations assail the hunting of grizzlies and urge that harvest be severely reduced or eliminated. In their view, further protection will "save" the species. Such views are usually restricted to that portion of grizzly mortality which is already under control by licenses, seasons, and regulations. The more significant portion of annual grizzly mortality (non-hunting) is generally ignored. With the elimination of legal hunting, it is possible that the "surplus" grizzlies could be involved in incidents and conflicts with man at a greater rate, and many more grizzlies could become casualties, especially in areas where sheep and livestock grazing permits are authorized.

At present, it does not appear that 1,000-2,000 licenses sold have significantly affected the rate of harvest. Grizzly hunting licenses are almost without exception bought as a precaution for an elk hunt in areas where both species occur. Variability of weather conditions, and the influence of berry and pine nut production on distribution of bears, appears to be a greater influence on the number of grizzly bears harvested than does the number of licenses issued. A stringent license and quota harvest system for grizzlies could adversely affect grizzly management (and, subsequently, the status of the species). A few unnecessarily harmful effects which

could happen are; 1) an almost complete loss of the legal grizzly hunting experience for many persons; 2) established quotas may not be accomplished; 3) a carry-over of quotas may be necessary; 4) increased encounters between grizzlies and people could result in a sudden rise in mortalities (of which more may be unreported); and 5) restricted under-licensing could possibly result in a highly lucrative and illegal traffic in pelts.

Steps that should be taken.

Because of the various values placed on the grizzly bear, many considerations must be considered by the state game departments in control, management and perpetuation of the species. Values and considerations which should be noted are: can grizzlies coexist with man's limited intrusion into their range; the conflict of grizzlies with range sheep and cattle; the economic value of hides to merchants, guides, and taxidermists; is the species heading for extinction; are they a species that can and should be hunted; are their habitats and ranges being diminished by encroachment; what problems do they present when appearing at campgrounds, dumps, cabins, ranch or lakes; how does the whiplash of controversy and publicity over Yellowstone grizzlies affect other populations; and are the welfare and destiny of grizzlies more secure under management by the state game departments or under the emotional demands and pressures for federal management.

The Montana Department of Fish and Game recognizes its responsibility to perpetuate the grizzly and to insure its future in Montana. It is our foremost objective to recognize any impending hazard to the several

grizzly populations in Montana and to initiate effective management when even grizzly welfare is threatened. At the present, and under existing conditions, hunting is not jeopardizing the grizzly in Montana.

Montana further acknowledges that the current status of the grizzly in the Gallatin National Forest adjacent to Yellowstone National Park may be described as rare (but by no means endangered). The Montana Fish and Game Commission deliberated the available facts and pressures of bio-politics before establishing the grizzly season for 1974. This resulted in regulations that excluded grizzly hunting in the five Montana hunting regions considered part of the Yellowstone ecosystem, and was a sincere effort by this department to recognize some of the state and national views and concern for the species in Montana.

National "public pressures", and the claims of "do-good" conservation groups that grizzlies are in peril and threatened with extinction, do not include an evaluation of current or predictable non-hunting mortalities. At least 10 of 21 grizzly mortalities in Idaho, where the grizzly is protected, were involved with sheep conflicts in the Targhee National Forest adjacent to the Gallatin National Forest during 1970-73. Government trappers have responded to grizzly depredations on sheep allotments in both the Shoshone and Teton National Forests in Wyoming.

Collectively, the *"official"* reports by respective game departments and Yellowstone National Park indicated that 72 percent of the known grizzly mortalities and removals from the Yellowstone ecosystem

populations, were by non-hunting causes during 1970-73. Even when the 36 non-hunting mortalities within Yellowstone National Park are deleted, the remaining 94 grizzly mortalities within the Yellowstone ecosystem consist of 38 percent by hunting and 62 percent by non-hunting.

There are strong indications that subsequent inquiries and findings will not reveal the total illegal, marauder, or nuisance grizzly mortalities (DeShon, personal comm.). In subsequent years, any absence of verified reports on grizzly deaths in Idaho may not be the result of none occurring, but may possibly be kept from state and agency personnel for verification. However, these four years do provide an insight into the probable magnitude of grizzly mortalities in Idaho where grizzly bear hunting seasons have not been authorized since 1946. About 50 percent (10 of 21) of the known non-hunting grizzly mortalities in Idaho were reported in areas adjacent to the Montana boundary. Several sheep permits in the Targhee National Forest of Idaho borders the Gallatin Forest in Montana, and undoubtedly the sheep and some of the kills may actually have been in Montana.

It would appear that the recent action by the Montana Department of Fish and Game reducing hunting mortalities should also extend to other agencies, individuals, groups, and organizations that may be able to implement restraints and controls on non-hunting mortalities. While sheep allotments on the Gallatin National Forest in the five hunting regions of Montana have voluntarily reduced from 18 in 1969 to 11 in 1974, is it unreasonable to expect that <u>all</u> public land grazing permits be eliminated from areas of known grizzly habitation where grizzly hunting has been banned?

Montana's Management Program and Philosophy

To declare the grizzly an endangered species, and to thereby eliminate the regulated hunting as it exists in Montana and Wyoming, would be harmful to the species. While other views are recognized, and respected, the State will resist further efforts to ban the hunting of grizzlies.

It should also be recognized by others that the Department pursues dynamic policies and programs. The Montana Fish and Game Commission's grizzly bear policy is, in part, ---"to perpetuate and manage this unique wildlife species in suitable habitat of the state for the people of Montana" (and the nation). With good evidence that huntable populations are present in Montana, "hunting seasons and regulations shall be based upon management experience and research findings concerning this bear."

The Montana Department of Fish and Game is continuing its current studies on grizzlies, participating in cooperative programs with the U. S. Forest Service, National Park Service, U. S. Bureau of Sport Fisheries and Wildlife, Wyoming and Idaho Fish and Game Departments, and initiating other more intensive research projects on grizzlies within the state.

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Appendix

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APPENDIX

Appendix

The foregoing is a consolidation of several progress reports on the grizzly bear studies in Montana. It was therefore necessary to delete some detailed information that usually appeared in previous reports. This Appendix is provided to maintain a continuity of these data.

Parasite examinations

The heads of 25 grizzlies and 11 black bears, and the viscera of 1 grizzly and 3 blacks, were available during 1973 for examination of internal parasites. Tongue tissues of 22 black bears taken during May - September 1973 in western Montana were available from the University of Montana in Missoula.

Tongue and masseter muscle tissues were sampled (Greer 1972, 1974). Trichinella larvae *(Trichinella spiralis)* were present in 64 percent of the grizzlies in 1973. Of 15 Montana grizzlies taken by hunters, 12 had from 1 to 352 larvae per gram (LPG) of tissue. Two Wyoming grizzlies were negative for the trichina worm.

Trichinella was present as 142 LPG in tissues from a black bear taken in the south fork of the Flathead river, hunting district 140. This continues an infrequent incidence of these larvae in black bears, and since 1968 only 5 of 113 have been infected (Worley, et al. 1974).

The viscera of an 8 year old male grizzly, from the vicinity of West Yellowstone, contained 12 ascarid roundworms *(Baylisascaris transfuga)* and 16 taeniid tapeworms *(Taenia* sp.). From 2 to 57 ascarids were present in the viscera from 3 black bears.

Appendix Table 1. Some data for the 15 grizzly bears harvested by hunters in Montana during the 1973 season.

	Date	District[1]	Location	Sex	Age[2]	Size of Skull[3]
1	Oct. 21	110	Shorty Cr.	Male	4	19 7/16
2	Oct. 25	140	Tunnel Cr.	Female	13	18 15/16
3	Oct. 25	140	Tunnel Cr.	Female	3	16 9/16
4	Oct. 26	140	Addition Cr.	Female	13	19 2/16
5	Nov. 5	140	Hungry Horse	Female	4	16 11/16
6	Nov. 16	140	Flat Cr.	Male	26	23 2/16
7	Sept. 17	150	Trickle Cr.	Male	3	16 15/16
8	Oct. 3	150	Gorge Cr.	Female	3	Broken
9	Oct. 5	150	Albino Basin	Male	3	Broken
10	Oct. 8	150	Gunsight Lake	Female	4	18 3/16
11	Oct. 12	150	Babcock Cr.	Female	3	16 8/16
12	Oct. 21	150	Sunburst Lake	Female	12	19 1/16
13	Sept. 20	280	Meadow Cr.	Male	6	22 13/16
14	Sept. 16	316	Cooke City	Male	5	20 15/16
15	Oct. 26	442	Willow Cr.	Female	4	18 9/16

[1]Hunting district designated on the 1973 hunting map.
[2]In years - fraction of year implied.
[3]Condylobasal length plus the zygomatic width, in inches.

Appendix Table 2. Limited information from known non-hunting grizzly bear mortalities and live orphaned cubs in Montana, and Glacier National Park (GNP), during 1973.

	Date	Location	Hunting District[1]	Category[2]	Sex	Age[3]	Whole Weight[4]	Total Length[5]	Size of Skull[6]
1	June 29	West Yell. Dump	361	N	Male	10	372	82	22 14/16
2	July 9	Polebridge	110	I	?	3	-	-	17 5/16
3	July 17	Observation Pass	150	I	Male	9	-	-	21 9/16
4	July -	Blackfeet Indian Res.	B	T	Male	-	-	-	No head
5	Sept. -	Blackfeet Indian Res.	B	T	Female	-	-	-	No head
6	Sept. 22	Flathead Indian Res.	F	T	Male	3	-	-	18 7/16
7	Oct. 5	Gardiner	313	M	Female	6	225	65	19 5/16
8	Oct. 13	Basin Creek	150	I	Male	7	-	-	20 14/16
9	Oct. 14	Teton River	444	M	Male	5	-	-	22 0/16
10	Oct. 27	Eureka	101	I	Female	4	-	-	16 15/16
11	Fall	Blackfeet Indian Res.	B	T	Male	5	-	-	19 10/16
1	July 19	Logging Lake (GNP)	-	M	Female	4	-	-	18 0/16

[1]Hunting district designated on the 1973 hunting map. (B) Blackfeet and (F) Flathead Indian Reservations.

[2]I - Illegal; M - Marauder; N - Nuisance; L - Live; T - Tribal residents.

[3]In years - fraction of year implied.

[4]Pounds.

[5]Inches.

[6]Condylobasal length plus zygomatic width, in inches.

Appendix Table 3. Trapping summary of 9 grizzly bears handled near West Yellowstone and Gardiner during the summer of 1973.

Number	Date Trapped	Location	Sex[1]	Age[2]	Weight[3]	Tags Present	Relocation Date-Area	Remarks
73-1	June 29	West Yellowstone dump	M	8½	S-372	Yes	Dispatched	Retrapped
73-2	July 12	West Yellowstone dump	M	A	S-560	No[4]	July 12-A	
73-3	July 17	West Yellowstone dump	M	A	S-510	Yes	July 17-B	
73-4	July 18	West Yellowstone dump	F	O	S-295	No	July 18-D	
73-5	July 26	So. Fork Madison R. Campground	F	5*	--	Yes	July 26 -	(Sow and 2 cubs released (at head of Mol Heron Cr. (11 mi. west of Gardiner.
73-6	July 26	So. Fork Madison R. Campground	F	C	E-30	No	July 26 -	((
73-7	July 26	So. Fork Madison R. Campground	F	C	E-30	No	July 26 -	((
73-8	Oct. 5	Travertine Flats, N. of Gardiner	M	C	S-50	No	Oct. 11 -	(Orphaned cubs-released (4 mi. north of Hebgen
73-9	Oct. 5	Travertine Flats, N. of Gardiner	F	C	S-50	No	Oct. 11 -	(Lake. (

[1]Male, Female, Unknown.
[2]Cub of year, Young, Adult, Old, *Known age, number is age in years.
[3]Estimated, Scale.
[4]Tags not present, but both ears notched and assumed to have lost previous tags.

Appendix Table 4. Identification markings for grizzly bears captured near West Yellowstone and Gardiner, and relocated during the summer of 1973.

Number	Tag or marker already present[1]		Initial or Supplement Tag, Marker Or Tattoo			Disposition
	Left Ear	Right Ear	Left Ear	Right Ear	Upper Lip	
73-1	YNP-7126	MFGD Round-Yellow G-235	None	None	-	Dispatched
73-2	No-notched	No-notched	MFGD Round RED X-2	MFGD Round RED X-1	F3	R13E,T8S,Sec. 2
73-3	MFGD Round RED G-134	No-notched	No	MFGD Round RED X-3 1/2x8" Yellow plastic streamer	F4	R11E,T6S,Sec. 33
73-4	No	No	MFGD Round RED X-4	MFGD Round RED X-7 1/2x8" Orange plastic streamer	FO	R11E,T8S,Sec. 12
73-5	MFGD Yellow Number Unknown Blue-White plastic rope with yellow flag	MFGD-Red Number Unknown	No	No	-	R7E,T9S,Sec. 16
73-6	No	No	No	No	-	R7E,T9S,Sec. 16
73-7	No	No	No	No	-	R7E,T9S,Sec. 16
73-8	No	No	MFGD R 0935	MFGD R 0934	-	R3E,T10S,Sec. 33
73-9	No	No	MFGD R 0933	MFGD R 0932	-	R3E,T10S,Sec. 33

[1]All tags are aluminum unless otherwise designated, and letters indicate agency: YNP-Yellowstone National Park; MFGD-Montana Fish and Game Department.